1. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{6x^3 + 7x^2 - 7x - 6}{8x^2 + 2x - 15}$$

A. Vertical Asymptote of $x = 0.75$ and hole at $x = -1.5$

B. Vertical Asymptotes of $x = 1.25$ and $x = -0.667$ with a hole at $x = -1.5$

C. Holes at $x = 1.25$ and $x = -1.5$ with no vertical asymptotes.

D. Vertical Asymptote of $x = 1.25$ and hole at $x = -1.5$

E. Vertical Asymptotes of $x = 1.25$ and $x = -1.5$ with no holes.

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2. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{9x^3 - 42x^2 + 16x + 32}{6x^2 + 7x - 20}$$

A. Vertical Asymptote of $x = -2.5$ and hole at $x = 1.333$

B. Vertical Asymptotes of $x = -2.5$ and $x = -0.667$ with a hole at $x = 1.333$

C. Vertical Asymptote of $x = 1.5$ and hole at $x = 1.333$

D. Vertical Asymptotes of $x = -2.5$ and $x = 1.333$ with no holes.

E. Holes at $x = -2.5$ and $x = 1.333$ with no vertical asymptotes.

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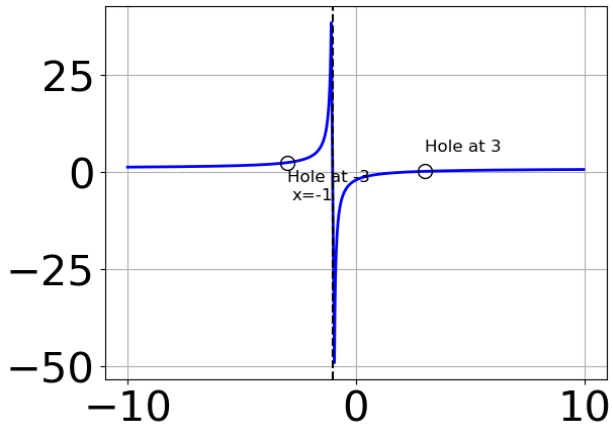
3. Which of the following functions *could* be the graph below?



A. $f(x) = \dfrac{x^3 - 10.0x^2 + 28.0x - 24.0}{x^3 + x^2 - 9.0x - 9.0}$

B. $f(x) = \dfrac{x^3 - 2.0x^2 - 9.0x + 18.0}{x^3 + x^2 - 9.0x - 9.0}$

C. $f(x) = \dfrac{x^3 + 2.0x^2 - 25.0x - 50.0}{x^3 - 1.0x^2 - 9.0x + 9.0}$

D. $f(x) = \dfrac{x^3 + 2.0x^2 - 9.0x - 18.0}{x^3 - 1.0x^2 - 9.0x + 9.0}$

E. None of the above are possible equations for the graph.

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4. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{12x^3 - 23x^2 - 22x + 40}{4x^2 + 3x - 10}$$

A. Horizontal Asymptote of $y = 3.0$

B. Horizontal Asymptote of $y = -2.0$ and Oblique Asymptote of $y = 3x - 8$

C. Horizontal Asymptote at $y = -2.0$

D. Horizontal Asymptote of $y = 3.0$ and Oblique Asymptote of $y = 3x - 8$

E. Oblique Asymptote of $y = 3x - 8$.

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5. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{8x^3 + 10x^2 - 57x - 45}{4x^2 - 17x - 15}$$

A. Horizontal Asymptote of $y = 2.0$ and Oblique Asymptote of $y = 2x + 11$

B. Horizontal Asymptote of $y = 5.0$ and Oblique Asymptote of $y = 2x + 11$

C. Horizontal Asymptote at $y = 5.0$

D. Oblique Asymptote of $y = 2x + 11$.

E. Horizontal Asymptote of $y = 2.0$

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6. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{15x^3 + 19x^2 - 4}{9x^3 - 14x - 8}$$

A. Horizontal Asymptote of $y = 1.667$

B. Vertical Asymptote of $y = 1.333$

C. Horizontal Asymptote of $y = 0$

D. Vertical Asymptote of $y = -1$

E. None of the above

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7. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{12x^3 - 7x^2 - 30x + 25}{9x^2 + 27x + 20}$$

A. Vertical Asymptotes of $x = -1.333$ and $x = -1.667$ with no holes.

B. Vertical Asymptote of $x = 1.333$ and hole at $x = -1.667$

C. Vertical Asymptote of $x = -1.333$ and hole at $x = -1.667$

D. Vertical Asymptotes of $x = -1.333$ and $x = 1.25$ with a hole at $x = -1.667$

E. Holes at $x = -1.333$ and $x = -1.667$ with no vertical asymptotes.

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8. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{2x^2 - x - 10}{4x^3 - 12x^2 - 25x + 75}$$

A. Horizontal Asymptote of $y = 0.500$ and Oblique Asymptote of $y = 2x - 5$

B. Horizontal Asymptote at $y = -2.000$

C. Horizontal Asymptote of $y = 0$

D. Oblique Asymptote of $y = 2x - 5$.

E. Horizontal Asymptote of $y = 0.500$

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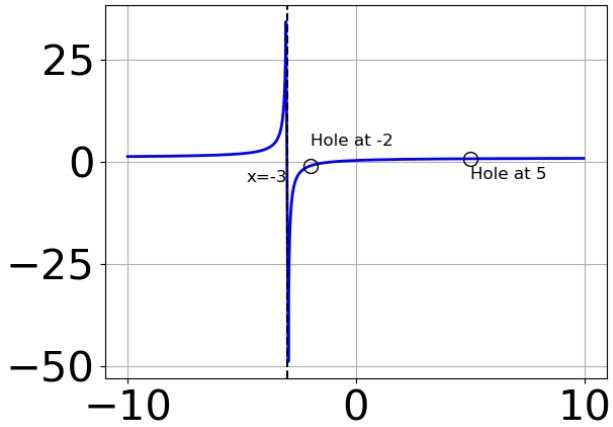
9. Which of the following functions *could* be the graph below?



A. $f(x) = \dfrac{x^3 + 4.0x^2 - 25.0x - 28.0}{x^3 - 19.0x - 30.0}$

B. $f(x) = \dfrac{x^3 + 2.0x^2 - 13.0x + 10.0}{x^3 - 19.0x + 30.0}$

C. $f(x) = \dfrac{x^3 - 2.0x^2 - 11.0x + 12.0}{x^3 - 19.0x + 30.0}$

D. $f(x) = \dfrac{x^3 - 2.0x^2 - 13.0x - 10.0}{x^3 - 19.0x - 30.0}$

E. None of the above are possible equations for the graph.

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10. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{6x^3 - 29x^2 + 43x - 20}{8x^2 - 26x + 15}$$

A. Vertical Asymptote of $x = 0.75$ and hole at $x = 2.5$

B. Vertical Asymptotes of $x = 0.75$ and $x = 2.5$ with no holes.

C. Vertical Asymptotes of $x = 0.75$ and $x = 1.333$ with a hole at $x = 2.5$

D. Holes at $x = 0.75$ and $x = 2.5$ with no vertical asymptotes.

E. Vertical Asymptote of $x = 0.75$ and hole at $x = 2.5$

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11. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{6x^3 - 5x^2 - 21x - 10}{12x^2 + 17x + 6}$$

A. Vertical Asymptotes of $x = -0.75$ and $x = -0.667$ with no holes.

B. Vertical Asymptotes of $x = -0.75$ and $x = 2.5$ with a hole at $x = -0.667$

C. Holes at $x = -0.75$ and $x = -0.667$ with no vertical asymptotes.

D. Vertical Asymptote of $x = -0.75$ and hole at $x = -0.667$

E. Vertical Asymptote of $x = 0.5$ and hole at $x = -0.667$

---

12. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{9x^3 - 15x^2 - 74x - 40}{9x^2 - 9x - 10}$$

A. Holes at $x = 1.667$ and $x = -0.667$ with no vertical asymptotes.

B. Vertical Asymptotes of $x = 1.667$ and $x = -1.667$ with a hole at $x = -0.667$

C. Vertical Asymptotes of $x = 1.667$ and $x = -0.667$ with no holes.

D. Vertical Asymptote of $x = 1.0$ and hole at $x = -0.667$

E. Vertical Asymptote of $x = 1.667$ and hole at $x = -0.667$

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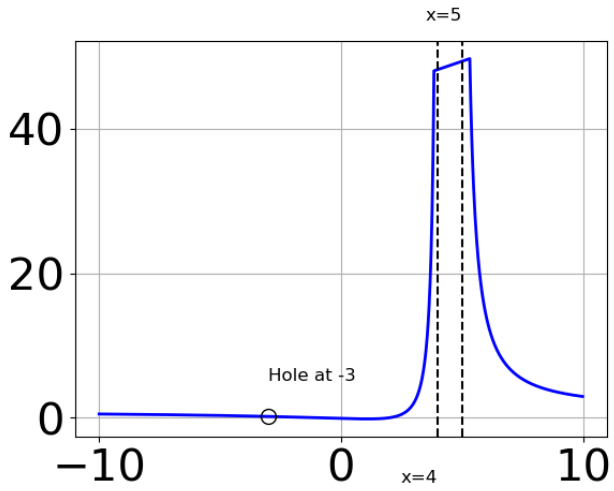
13. Which of the following functions *could* be the graph below?



A. $f(x) = \dfrac{x^3 - 2.0x^2 - x + 2.0}{x^3 - 6.0x^2 - 7.0x + 60.0}$

B. $f(x) = \dfrac{x^3 + 2.0x^2 - 5.0x - 6.0}{x^3 - 6.0x^2 - 7.0x + 60.0}$

C. $f(x) = \dfrac{x^3 - 2.0x^2 - 5.0x + 6.0}{x^3 + 6.0x^2 - 7.0x - 60.0}$

D. $f(x) = \dfrac{x^3 - 4.0x^2 - 7.0x + 10.0}{x^3 + 6.0x^2 - 7.0x - 60.0}$

E. None of the above are possible equations for the graph.

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14. Determine the horizontal and/or oblique asymptotes in the rational

function below.

$$f(x) = \frac{12x^3 - 5x^2 - 43x + 30}{3x^2 - 20x + 25}$$

A. Horizontal Asymptote of $y = 4.0$

B. Horizontal Asymptote of $y = 5.0$ and Oblique Asymptote of $y = 4x + 25$

C. Horizontal Asymptote at $y = 5.0$

D. Oblique Asymptote of $y = 4x + 25$.

E. Horizontal Asymptote of $y = 4.0$ and Oblique Asymptote of $y = 4x + 25$

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15. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{12x^3 - 35x^2 + 33x - 10}{4x^2 + 7x - 15}$$

A. Horizontal Asymptote of $y = -3.0$ and Oblique Asymptote of $y = 3x - 14$

B. Horizontal Asymptote at $y = -3.0$

C. Oblique Asymptote of $y = 3x - 14$.

D. Horizontal Asymptote of $y = 3.0$ and Oblique Asymptote of $y = 3x - 14$

E. Horizontal Asymptote of $y = 3.0$

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16. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{30x^3 - 47x^2 - 114x - 45}{10x^3 + 22x^2 - 42x - 18}$$

A. Horizontal Asymptote of $y = 3.000$

B. Horizontal Asymptote of $y = 0$

C. Vertical Asymptote of $y = 3$

D. Vertical Asymptote of $y = -1.000$

E. None of the above

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17. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{6x^3 - 7x^2 - 7x + 6}{6x^2 + 5x - 6}$$

A. Holes at $x = -1.5$ and $x = 0.667$ with no vertical asymptotes.

B. Vertical Asymptotes of $x = -1.5$ and $x = 0.667$ with no holes.

C. Vertical Asymptote of $x = 1.0$ and hole at $x = 0.667$

D. Vertical Asymptote of $x = -1.5$ and hole at $x = 0.667$

E. Vertical Asymptotes of $x = -1.5$ and $x = 1.5$ with a hole at $x = 0.667$

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18. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{3x^2 - 17x + 10}{15x^3 - 58x^2 - 16x + 32}$$

A. Horizontal Asymptote at $y = 5.000$

B. Horizontal Asymptote of $y = 0$

C. Horizontal Asymptote of $y = 0.200$ and Oblique Asymptote of $y = 5x + 9$

D. Oblique Asymptote of $y = 5x + 9$.

E. Horizontal Asymptote of $y = 0.200$

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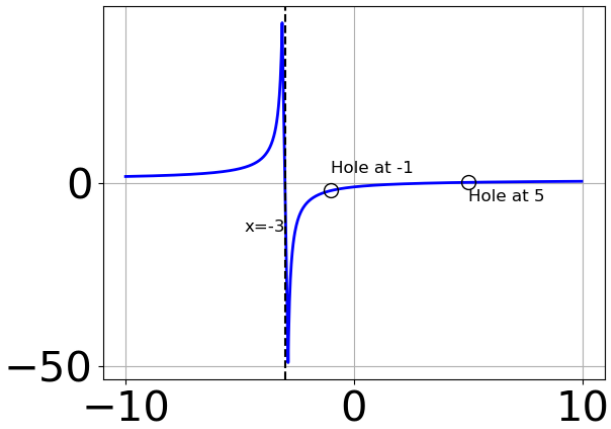
19. Which of the following functions *could* be the graph below?



A. $f(x) = \dfrac{x^3 + 7.0x^2 + 7.0x - 15.0}{x^3 + x^2 - 17.0x + 15.0}$

B. $f(x) = \dfrac{x^3 + x^2 - 24.0x + 36.0}{x^3 - 1.0x^2 - 17.0x - 15.0}$

C. $f(x) = \dfrac{x^3 - 6.0x^2 - 7.0x + 60.0}{x^3 + x^2 - 17.0x + 15.0}$

D. $f(x) = \dfrac{x^3 - 7.0x^2 + 7.0x + 15.0}{x^3 - 1.0x^2 - 17.0x - 15.0}$

E. None of the above are possible equations for the graph.

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20. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{6x^3 + 13x^2 - 9x - 10}{12x^2 + 23x + 10}$$

A. Vertical Asymptotes of $x = -1.25$ and $x = -2.5$ with a hole at $x = -0.667$

B. Vertical Asymptote of $x = 0.5$ and hole at $x = -0.667$

C. Vertical Asymptotes of $x = -1.25$ and $x = -0.667$ with no holes.

D. Vertical Asymptote of $x = -1.25$ and hole at $x = -0.667$

E. Holes at $x = -1.25$ and $x = -0.667$ with no vertical asymptotes.

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21. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{9x^3 - 36x^2 + 17x + 30}{12x^2 - 11x - 15}$$

A. Vertical Asymptotes of $x = -0.75$ and $x = 1.667$ with no holes.

B. Vertical Asymptotes of $x = -0.75$ and $x = -0.667$ with a hole at $x = 1.667$

C. Holes at $x = -0.75$ and $x = 1.667$ with no vertical asymptotes.

D. Vertical Asymptote of $x = -0.75$ and hole at $x = 1.667$

E. Vertical Asymptote of $x = 0.75$ and hole at $x = 1.667$

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22. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{12x^3 + 41x^2 - 38x - 40}{9x^2 + 18x + 8}$$

A. Vertical Asymptotes of $x = -1.333$ and $x = -0.667$ with no holes.

B. Vertical Asymptote of $x = -1.333$ and hole at $x = -0.667$

C. Holes at $x = -1.333$ and $x = -0.667$ with no vertical asymptotes.

D. Vertical Asymptote of $x = 1.333$ and hole at $x = -0.667$

E. Vertical Asymptotes of $x = -1.333$ and $x = 1.25$ with a hole at $x = -0.667$

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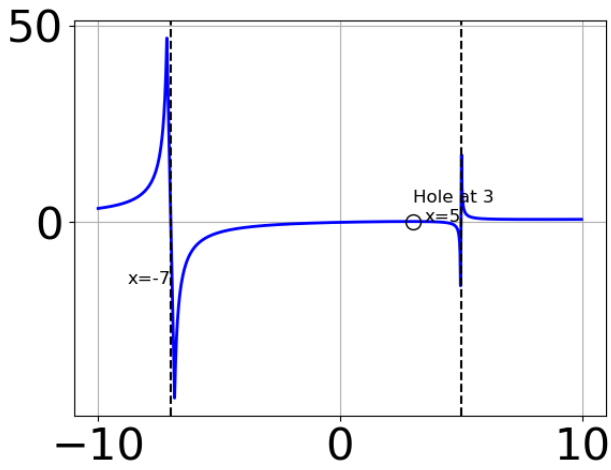
23. Which of the following functions *could* be the graph below?



A. $f(x) = \dfrac{x^3 - 21.0x + 20.0}{x^3 - 1.0x^2 - 41.0x + 105.0}$

B. $f(x) = \dfrac{x^3 + 12.0x^2 + 39.0x + 28.0}{x^3 + x^2 - 41.0x - 105.0}$

C. $f(x) = \dfrac{x^3 - 8.0x^2 + 19.0x - 12.0}{x^3 - 1.0x^2 - 41.0x + 105.0}$

D. $f(x) = \dfrac{x^3 + 8.0x^2 + 19.0x + 12.0}{x^3 + x^2 - 41.0x - 105.0}$

E. None of the above are possible equations for the graph.

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24. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{4x^3 - 16x^2 - 9x + 36}{2x^2 - 3x - 9}$$

A. Horizontal Asymptote of $y = 2.0$

B. Horizontal Asymptote at $y = 3.0$

C. Horizontal Asymptote of $y = 2.0$ and Oblique Asymptote of $y = 2x - 5$

D. Oblique Asymptote of $y = 2x - 5$.

E. Horizontal Asymptote of $y = 3.0$ and Oblique Asymptote of $y = 2x - 5$

25. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{4x^3 - 19x + 15}{2x^2 + x - 10}$$

A. Horizontal Asymptote of $y = 2.0$

B. Horizontal Asymptote of $y = 2.0$ and Oblique Asymptote of $y = 2x - 1$

C. Horizontal Asymptote of $y = 2.0$ and Oblique Asymptote of $y = 2x - 1$

D. Oblique Asymptote of $y = 2x - 1$.

E. Horizontal Asymptote at $y = 2.0$

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26. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{5x^2 + 22x + 8}{25x^3 - 50x^2 - 4x + 8}$$

A. Oblique Asymptote of $y = 5x - 32$.

B. Horizontal Asymptote of $y = 0.200$

C. Horizontal Asymptote of $y = 0.200$ and Oblique Asymptote of $y = 5x - 32$

D. Horizontal Asymptote at $y = -4.000$

E. Horizontal Asymptote of $y = 0$

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27. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{6x^3 - 1x^2 - 47x + 30}{6x^2 + 5x - 6}$$

A. Vertical Asymptotes of $x = -1.5$ and $x = 2.5$ with a hole at $x = 0.667$

B. Vertical Asymptote of $x = 1.0$ and hole at $x = 0.667$

C. Vertical Asymptotes of $x = -1.5$ and $x = 0.667$ with no holes.

D. Vertical Asymptote of $x = -1.5$ and hole at $x = 0.667$

E. Holes at $x = -1.5$ and $x = 0.667$ with no vertical asymptotes.

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28. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{5x^2 - 27x + 10}{15x^3 - 31x^2 - 50x + 24}$$

A. Oblique Asymptote of $y = 3x + 10$.

B. Horizontal Asymptote of $y = 0.333$ and Oblique Asymptote of $y = 3x + 10$

C. Horizontal Asymptote of $y = 0.333$

D. Horizontal Asymptote of $y = 0$

E. Horizontal Asymptote at $y = 5.000$

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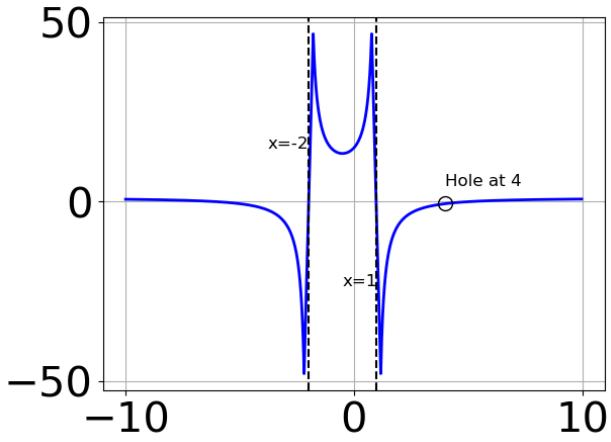
29. Which of the following functions *could* be the graph below?



A. $f(x) = \dfrac{x^3 - 3.0x^2 - 34.0x + 120.0}{x^3 - 3.0x^2 - 6.0x + 8.0}$

B. $f(x) = \dfrac{x^3 + 3.0x^2 - 34.0x - 120.0}{x^3 + 3.0x^2 - 6.0x - 8.0}$

C. $f(x) = \dfrac{x^3 + 2.0x^2 - 33.0x - 90.0}{x^3 + 3.0x^2 - 6.0x - 8.0}$

D. $f(x) = \dfrac{x^3 - 5.0x^2 - 36.0x + 180.0}{x^3 - 3.0x^2 - 6.0x + 8.0}$

E. None of the above are possible equations for the graph.

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30. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{6x^3 - 23x^2 + 9x + 18}{6x^2 + 19x + 10}$$

A. Vertical Asymptotes of $x = -2.5$ and $x = 1.5$ with a hole at $x = -0.667$

B. Holes at $x = -2.5$ and $x = -0.667$ with no vertical asymptotes.

C. Vertical Asymptotes of $x = -2.5$ and $x = -0.667$ with no holes.

D. Vertical Asymptote of $x = 1.0$ and hole at $x = -0.667$

E. Vertical Asymptote of $x = -2.5$ and hole at $x = -0.667$
